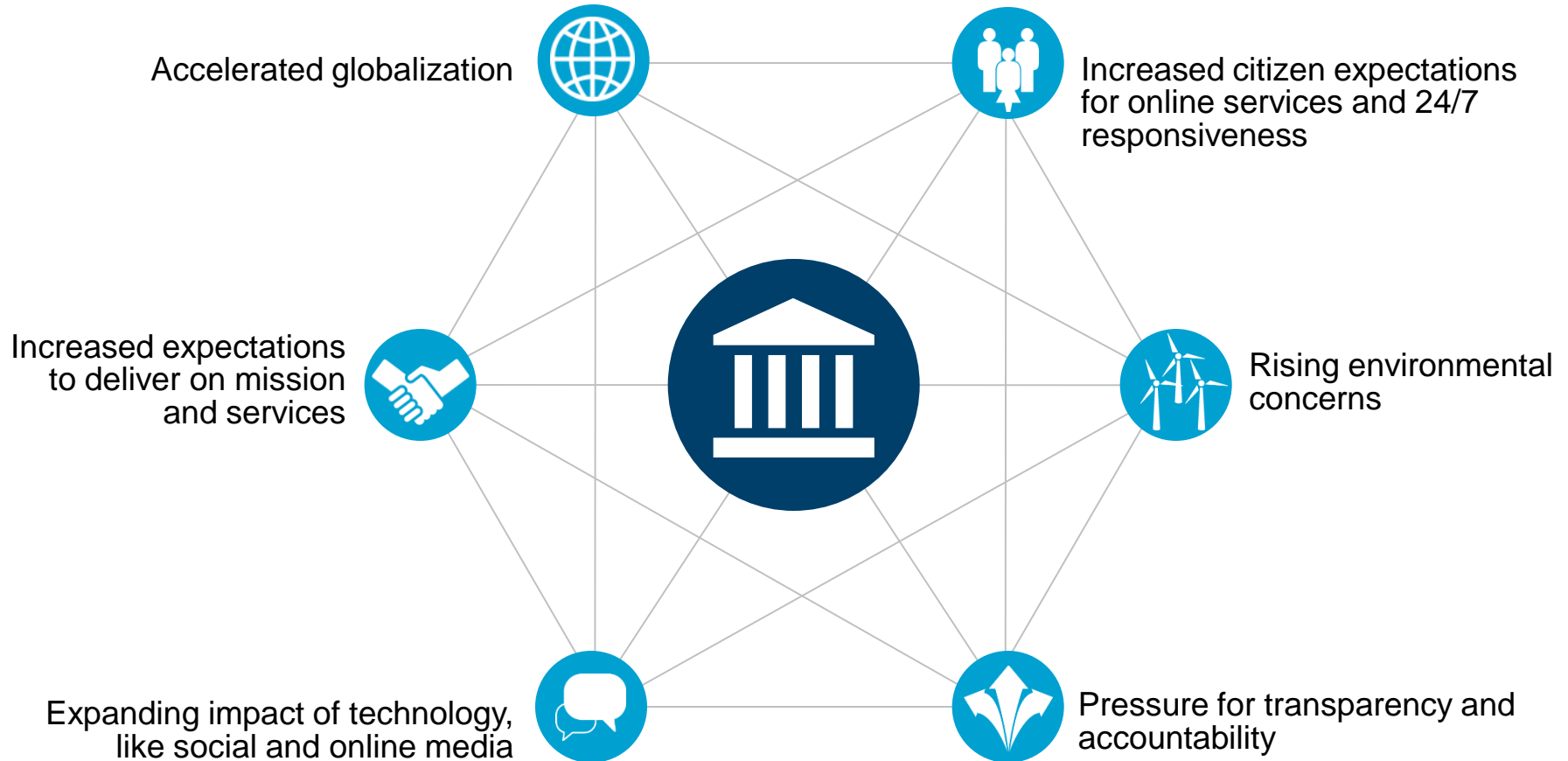# Driving Innovation and Results-Based Government with Smarter Analytics

The external pressures on government aren't subsiding

Accelerated globalization

Increased citizen expectations for online services and 24/7 responsiveness

Increased expectations to deliver on mission and services

Rising environmental concerns

Expanding impact of technology, like social and online media

Pressure for transparency and accountability

The need for progress is clear

3.3 billion

… people lived in cities in 2007—for the first time in history, the majority of the world's population.[1]

Today 85%

… of government leaders expect a high/very high level of complexity that will reshape societies and governing over the next five years.[2]
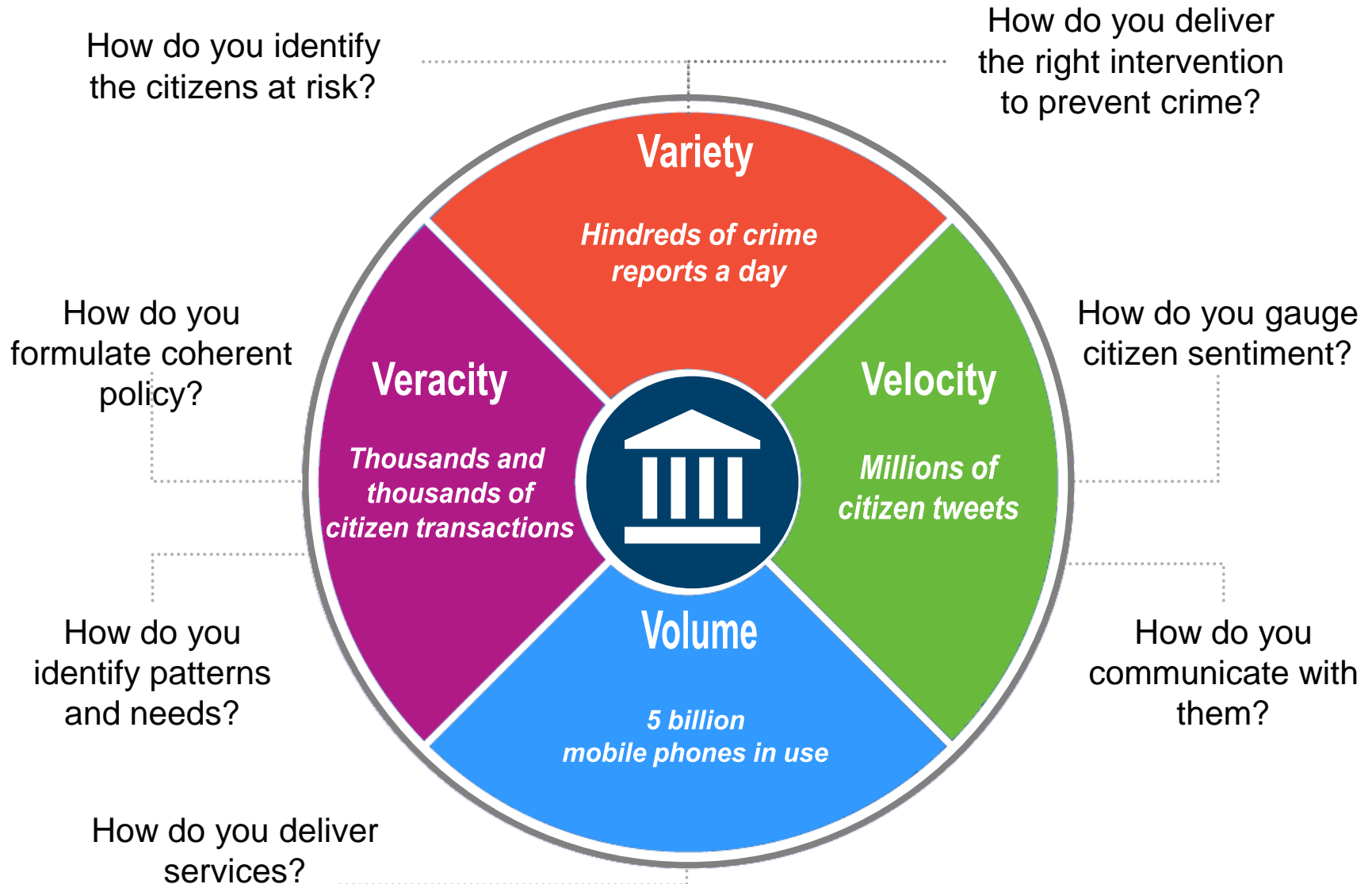
Only 38%

… of government CFOs think that they are effective in measuring and monitoring the performance of programs and services delivery.[3]

1 IBM, "Smarter Cities" event speech, 2009.
2 IBM Institute for Business Value, *The power of analytics in the public sector,* March 2011.
3 IBM Institute for Business Value, *The Global CFO Study,* 2010.

Today we see "big data" impacting government in many areas

How do you identify the citizens at risk?

How do you deliver the right intervention to prevent crime?

Variety
Hindreds of crime reports a day

How do you formulate coherent policy?

Veracity
Thousands and thousands of citizen transactions

Velocity
Millions of citizen tweets

How do you gauge citizen sentiment?

Volume
5 billion mobile phones in use

How do you identify patterns and needs?

How do you communicate with them?

How do you deliver services?

Big data and analytics are transforming government, turning initiatives into imperatives through big data and collaboration

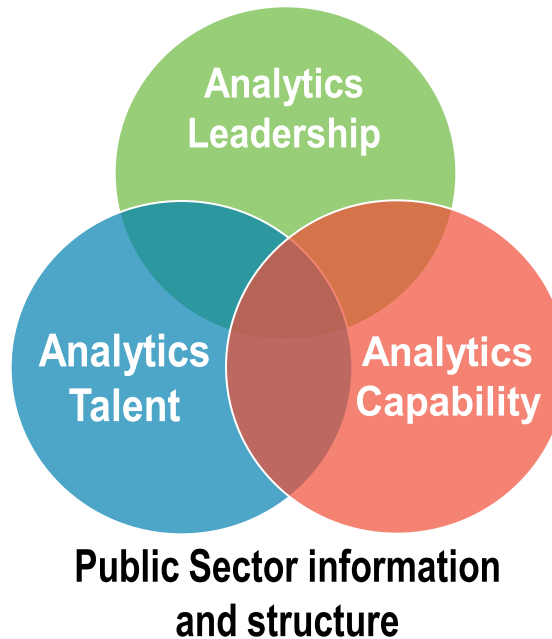| **Profound implications** ➔	**Roles for analytics**

Profound implications

- Higher expectations, heightened scrutiny

- Emerging enterprise roles alongside the "natural silos" of missions

- Tensions – governance, management and oversight

- Information management shifts from collections to usage – new opportunities

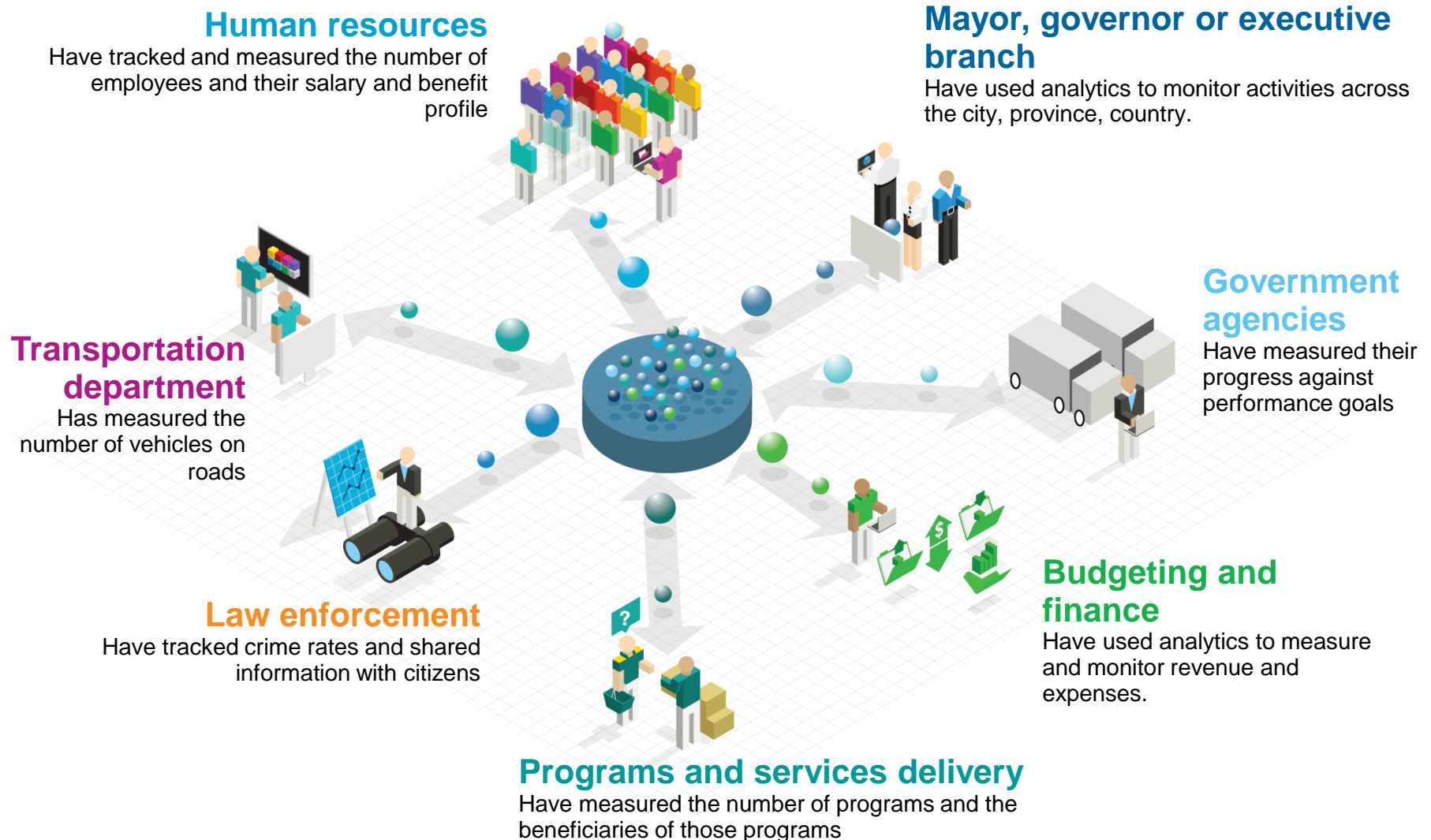- Heightened competition for analytics talent, analytics leadership

Analytics Leadership

Analytics Talent

Analytics Capability

Public Sector information and structure

Roles for analytics

- Exploration and discovery of student needs

- Policy, program planning, design and evaluations of success

- Service delivery and operations

- Sustainability, economic security and risk reduction/control

- Measurement and evaluation

Governments have turned to analytics to address these challenges

Human resources
Have tracked and measured the number of employees and their salary and benefit profile

Mayor, governor or executive branch
Have used analytics to monitor activities across the city, province, country.

Government agencies
Have measured their progress against performance goals

Transportation department
Has measured the number of vehicles on roads

Law enforcement
Have tracked crime rates and shared information with citizens

Programs and services delivery
Have measured the number of programs and the beneficiaries of those programs

Budgeting and finance
Have used analytics to measure and monitor revenue and expenses.

6

But what if you could…

Human resources
…could attract and retain top-performing employees by understanding drivers behind employee satisfaction?

Mayor, governor or executive branch
…could see how every tax dollar is spent and every program performs in unison?

Government agencies
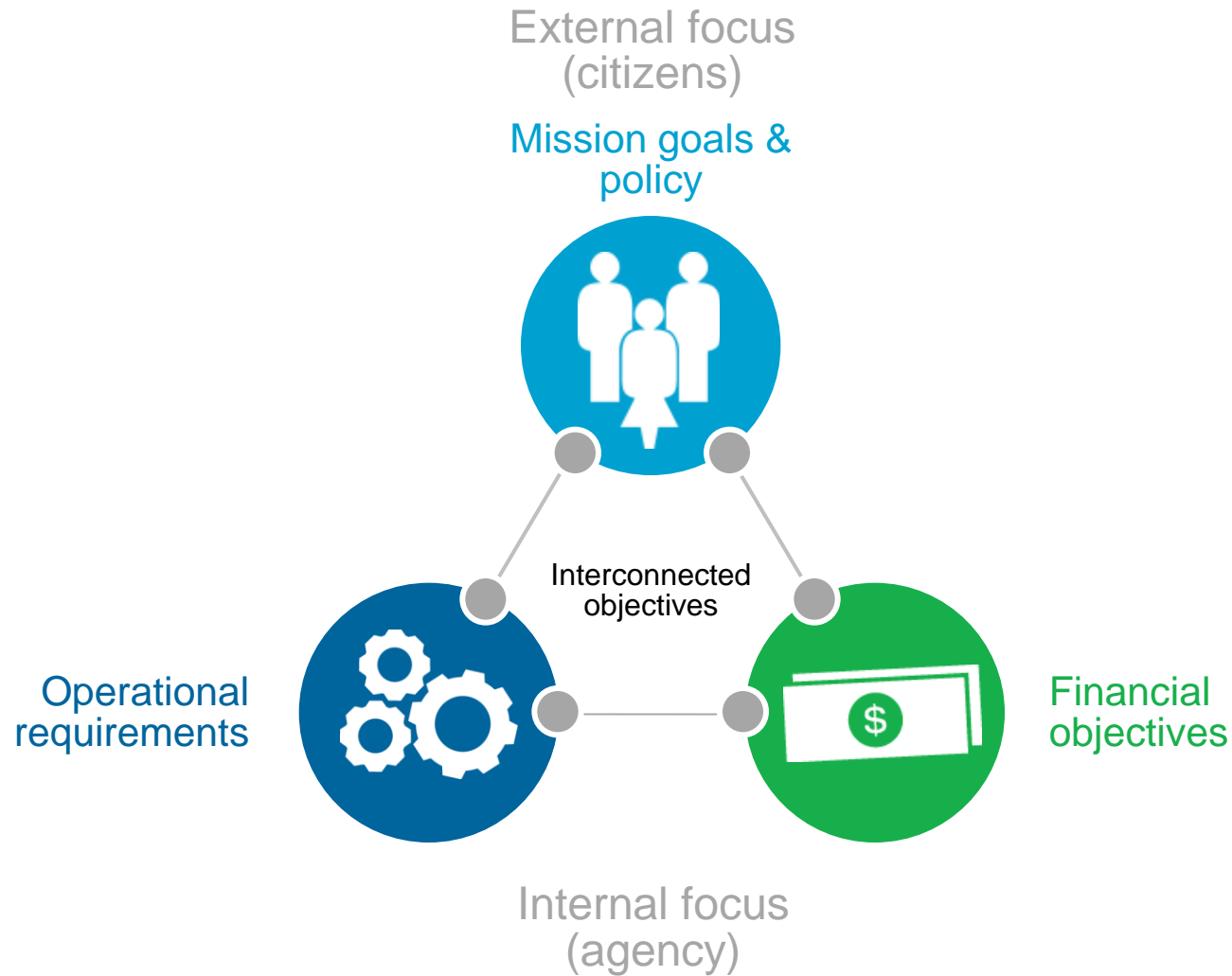…could gain critical insights to manage and maximize resources—people, capital and processes?

Transportation department
…could improve traffic flows and reduce emissions?

Law enforcement
…could have insights to beat criminals to the scene?

Budgeting and finance
…could have real-time insights into program budgets across jurisdictions to reduce spending responsibly?

Programs and services delivery
…could predict current and future needs of citizens and design programs accordingly?

7

By aligning the key foundations of government to understand performance and effectiveness

External focus
(citizens)

Mission goals &
policy

Interconnected
objectives

Operational
requirements

Financial
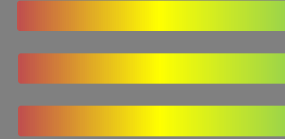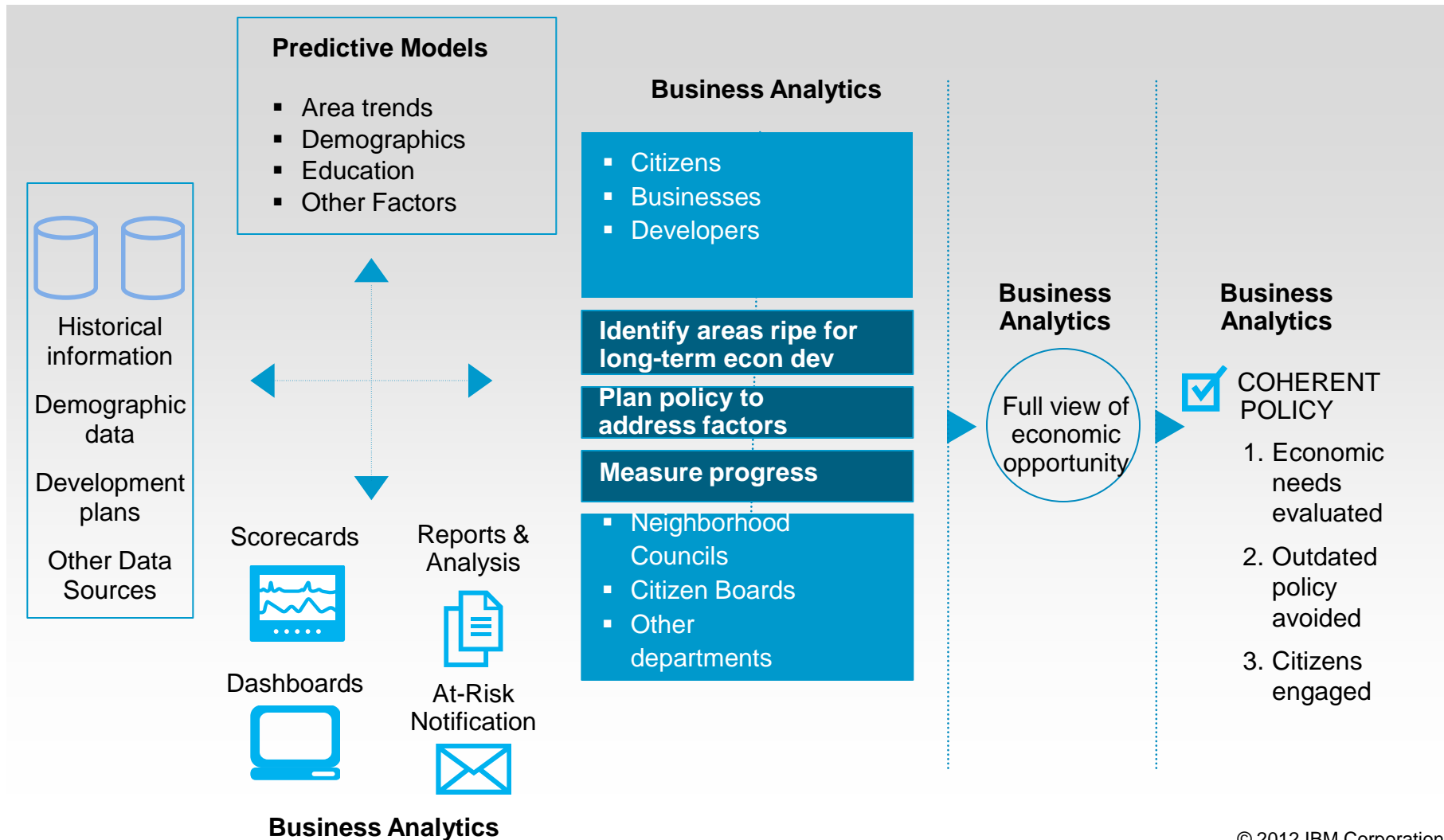objectives

Internal focus
(agency)

Scenario: What should the long-term transit policy be?

The **policy** decision depends on the combination of these three factors:

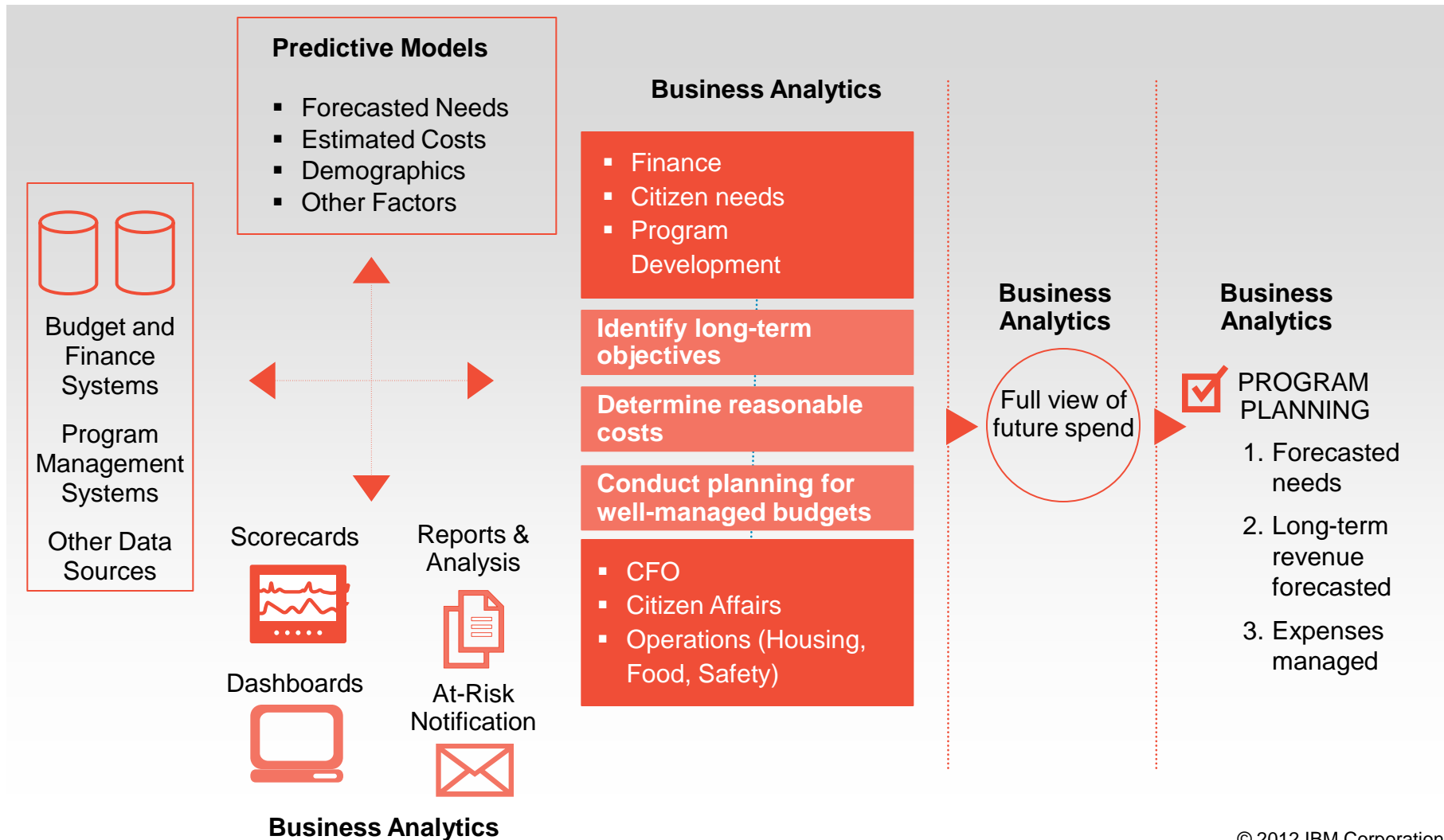**Historic transit usage**

Constituent sentiment and input

Planned land use development

Long-range Transportation Policy development

Recommended Action:
Build larger network of bike lanes, invest in light rail, reduce the investment in road construction.

101010 010101

Transit use data

Predictive transit usage models

Transit usage has been growing steadily in the targeted regions as more and more citizens opt for public transit.

101010 010101

Citizen input and sentiment

Social media analytics

Citizen sentiment indicates a desire for more sustainable, reliable and cost effective transit options in the future.

Executive reports on progress, performance and patterns

101010 010101

Development plans

"What if" budget scenarios

Less investment in highway infrastructure and more in additional transit options will yield higher returns and lower costs over the next decade.

Economic policy development scenario

Predictive Models

- Area trends
- Demographics
- Education
- Other Factors

Business Analytics

- Citizens
- Businesses
- Developers

Historical information

Demographic data

Development plans

Other Data Sources

Scorecards

Reports & Analysis

Dashboards

At-Risk Notification

Identify areas ripe for long-term econ dev

Plan policy to address factors

Measure progress

- Neighborhood Councils
- Citizen Boards
- Other departments

Business Analytics

Full view of economic opportunity

Business Analytics

☑ COHERENT POLICY

1. Economic needs evaluated

2. Outdated policy avoided

3. Citizens engaged

Business Analytics

Results-based budgeting scenario

Predictive Models

- Forecasted Needs
- Estimated Costs
- Demographics
- Other Factors

Budget and Finance Systems

Program Management Systems

Other Data Sources

Scorecards

Reports & Analysis

Dashboards

At-Risk Notification

Business Analytics

Business Analytics

- Finance
- Citizen needs
- Program Development

Identify long-term objectives

Determine reasonable costs

Conduct planning for well-managed budgets

- CFO
- Citizen Affairs
- Operations (Housing, Food, Safety)

Business Analytics

Full view of future spend

Business Analytics

PROGRAM PLANNING

1. Forecasted needs

2. Long-term revenue forecasted

3. Expenses managed

Throughout all parts of your organization

Executive Level

Gain critical insights across government , leading to better decision making and the best outcomes.

Agencies

Gain a strategic view of programs and budgets from the top level of government to the agency staff level.

Programs

Provide enhanced citizen services through a better understanding of citizen needs, now and in the future.

Operations

Gain critical insights into operational resources and costs, plus predict and help prevent outages in key public services.

HR

Manage HR requirements by understanding critical positions that will need to be staffed in the future.

Finance

Gain a strategic view of revenue streams, budgets, costs and expenses government-wide or at the agency and departmental level.

Revenue

Predict who will pay their taxes, help prevent social services waste fraud and abuse, and guard against improper payments.

How do you get started?

How often have you heard:

"We have all this data. Let's use analytics to measure things!"

But becoming an analytics-driven organization is not that simple

Data	Information	Technology	Strategy

Analytics-driven organizations combine all these factors.

The key to creating an analytics culture requires uniting key parts of the organization's information needs

Long Term Mission

Strategic Goals

Information Governance

Analytics Strategy

To get where you are want to go, you need to know where you have been

Today

Tomorrow

How did we perform?	Why did things occurring?	What could we have done?

Dashboards & scorecards

Social Analytics

Reporting & visualization

Sentiment Analysis

Real-time Decisions

Forecasting & simulation

Predictive modeling

Planning/ budgeting
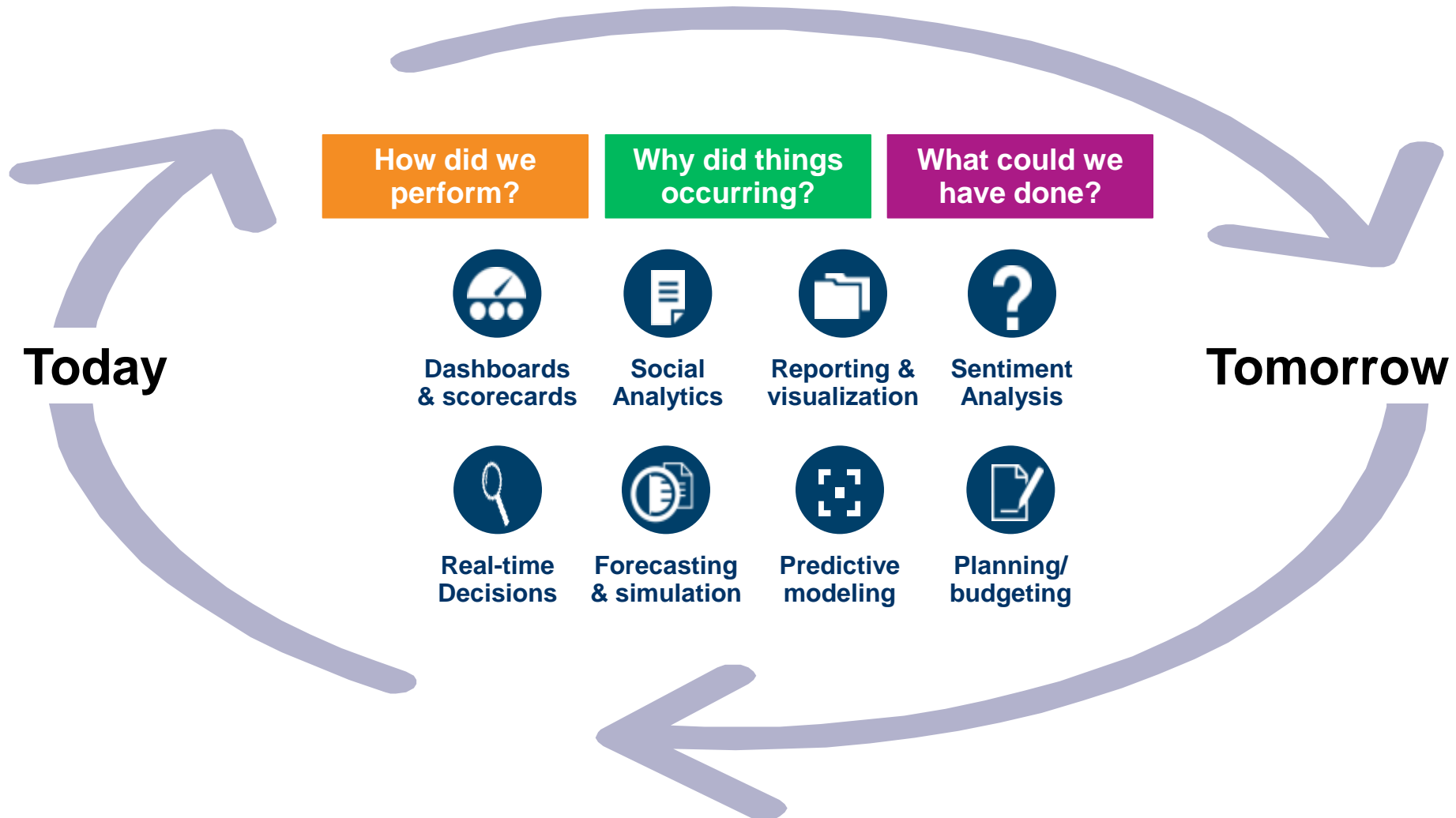
Understanding the roles of each part of the organization and their impact on the other is key

Mission goals

This is where you are heading

This is how you get there

Operational requirements

Financial objectives
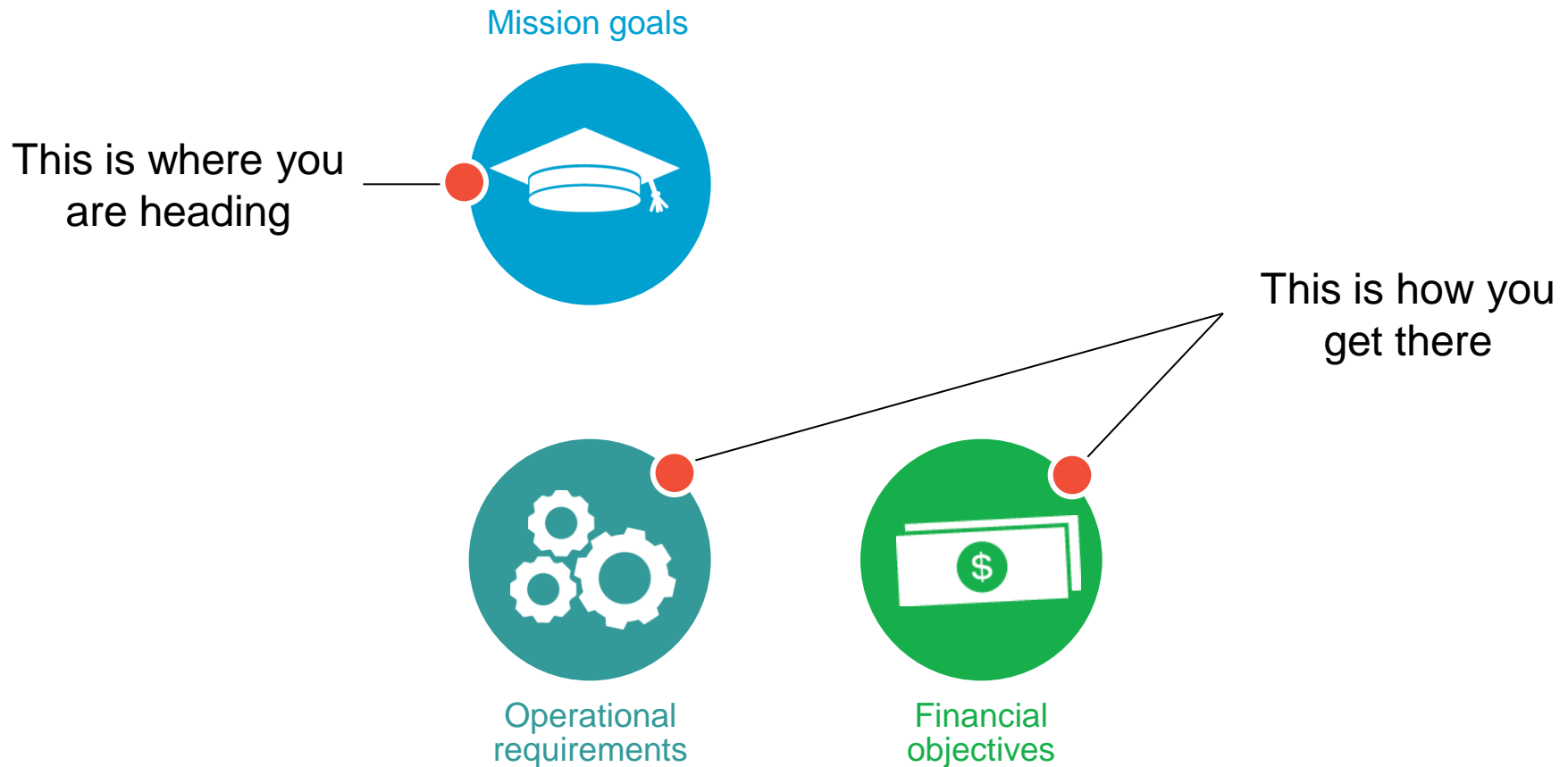
Aligning these factors around the strategic goals of the institution is critical

External focus
(citizens)

Mission goals

Interconnected
objectives

Operational
requirements

Financial
objectives

Internal focus
(agency)
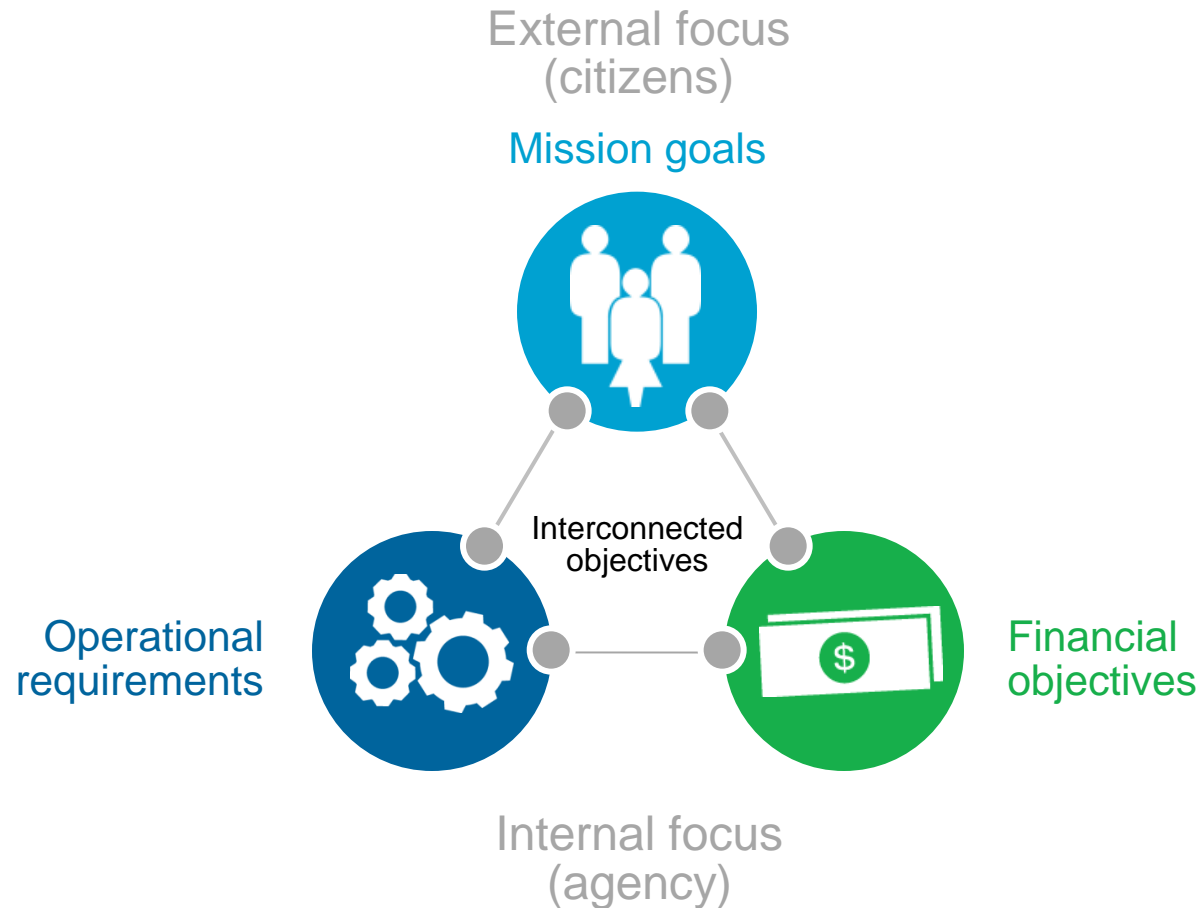
Those goals must be S.M.A.R.T. goals that can be measured and acted upon

External focus
(citizens)

Mission goals

Interconnected
objectives

Operational
requirements

Financial
objectives

Internal focus
(agency)
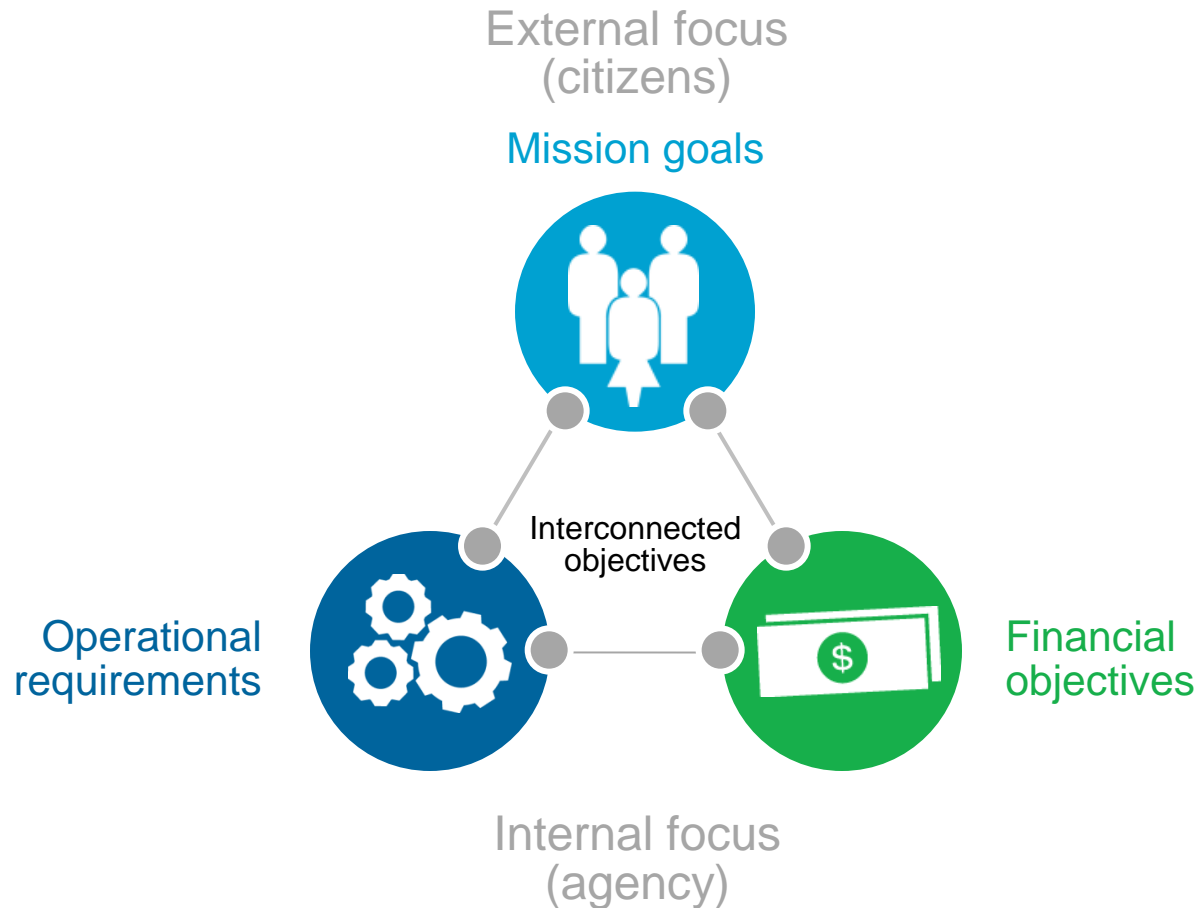
Specific

Measurable

Attainable

Relevant

Timely

The strategic goals of the institution flow down, guiding each part of the organization on their specific goals

Strategic goals of the government

Departmental goals

Divisional goals

Workgroup goals

Executive Level

Agencies and Departments

Divisions

Workgroups (within each division)
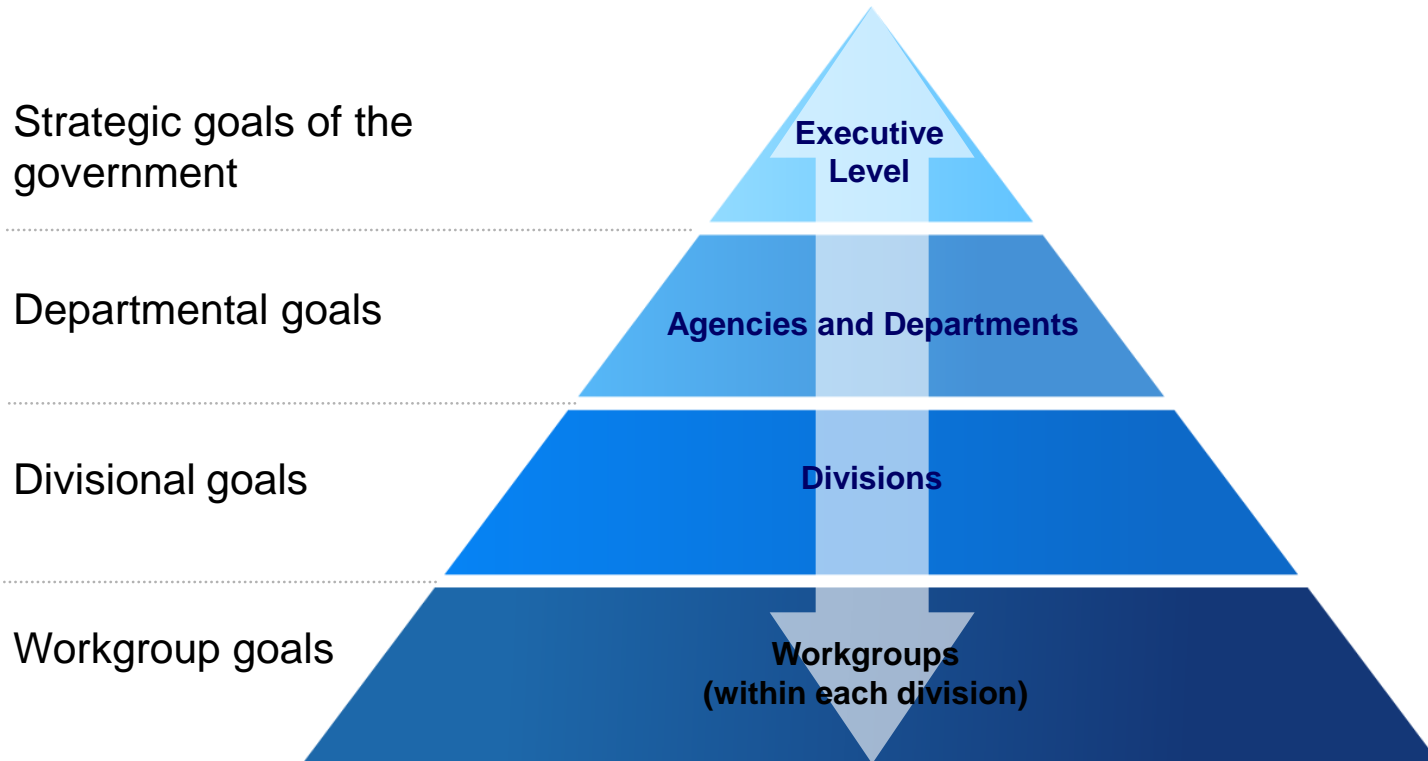
How can you can you see the return on investment with an analytics strategy?

Desired results

| Improved performance | Lower costs | Better outcomes | Smarter education |

| Dashboards & scorecards | Social Analytics | Reporting & visualization | Sentiment Analysis | Real-time Decisions | Forecasting & simulation | Predictive modeling | Planning/ budgeting |

Varied, unconnected data sources

| Message sources | Relational sources | Unstructured data | Application sources | OLAP sources | Modern and legacy sources |

It is accomplished when the line of business and IT work together on an analytics strategy

Desired results

Improved performance	Lower costs	Better outcomes	Smarter education

Line of Business alignment	IT alignment

Dashboards & scorecards	Social Analytics	Reporting & visualization	Sentiment Analysis	Real-time Decisions	Forecasting & simulation	Predictive modeling	Planning/ budgeting

Varied, unconnected data sources

Message sources	Relational sources	Unstructured data	Application sources	OLAP sources	Modern and legacy sources

By understanding the different analytics roles within the organization

Consumers of
information

Creators of
analytics content

Managers of analytics
process and governance
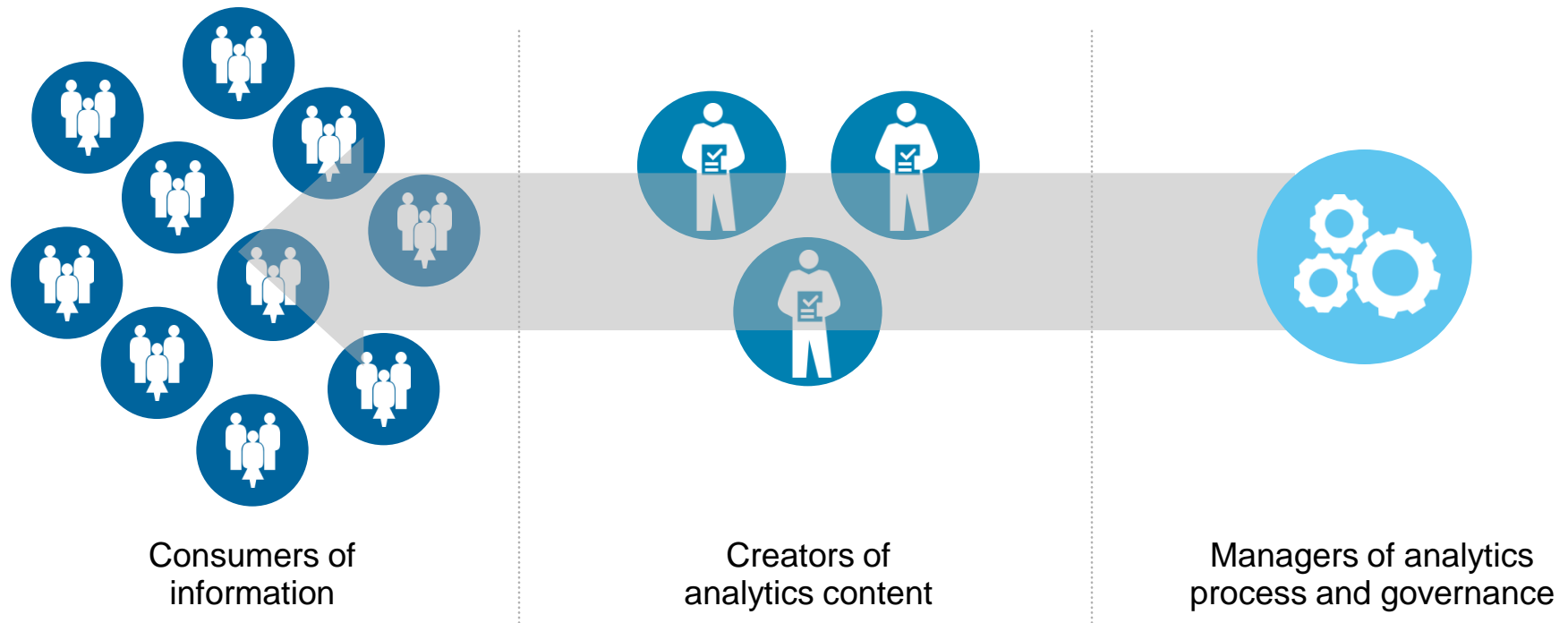
How do you begin this analytics journey?

1

Focus on the biggest and highest value opportunities

2

Start with questions, not with data

3

Embed insights to drive actions and deliver value

4

Keep existing capabilities while adding new ones

5

Develop an analytics plan for the future

Most important:
Have a strong executive sponsor

Transforming government in four key areas

Industry imperative	Desired outcomes	Where we've done it
Improve Citizen Services	▪ Provide enhanced citizen services through a better understanding of citizen need ▪ Provide citizen services more efficiently and cost-effectively ▪ Minimize fraud	**Social Services** Reduced over $11M in fraud and waste
Manage resources more effectively	▪ Maximize tax collection effectiveness ▪ Increase tax revenues ▪ Minimize tax fraud ▪ Manage workforce and assets more efficiently.	**SKAT** 18% reduction in tax collections workload
Improve public safety and security	▪ Reduce crime and improve public safety by identifying trouble areas in advance and taking preventative actions ▪ Allocate law enforcement resources more effectively	**Memphis Police Department** 30% reduction in serious crime and 15% reduction in violent crime
Strengthen national security	▪ Increase threat prediction and prevention and expedite the flow of people and goods across borders. ▪ Improve operational effectiveness while reducing costs and waste.	**United States Coast Guard** $500,000 annual savings in parts costs

Delivering smarter citizen services is complicated

Inability to create accurate citizen profiles and needs

Poor visibility into citizen needs and requirements

Increased citizen demands for more online services

Multiple sources of information that often not easily accessed

Inability to understand future citizen needs and how to deliver

Limited view of all programs and initiatives impacting citizens
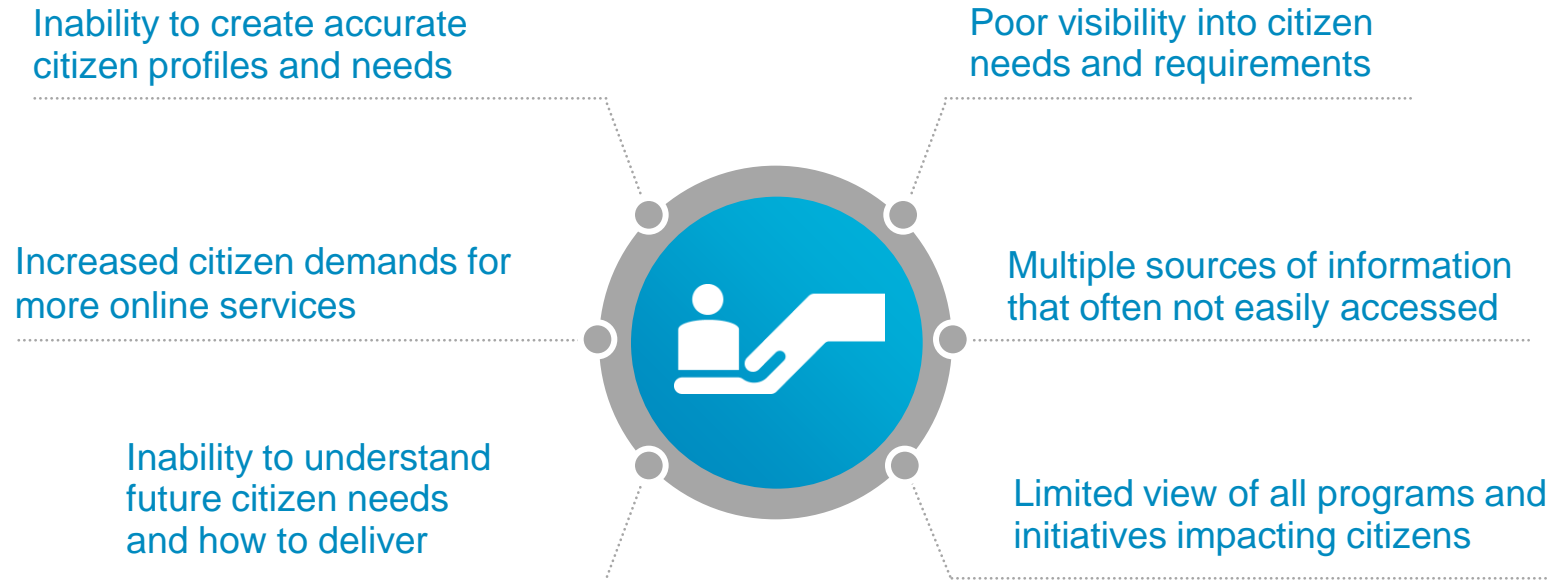
And the city council wants to know:
How we can address citizen unemployment TOMORROW?
How will you respond?

Analytics turn data to insights to actions for better citizen services

Delivering smarter citizen services and programs means:
- Citizen services are delivered efficiently and at lower costs.
- The future needs of citizens are anticipated and planned.
- Programs and resources are matched to the highest-priority citizens.
- Resources are focused on high-priority service areas.

Data	Analytics capabilities	Insight into action
- Citizen information systems - Program data systems - Budget and finance systems - Social media	- Reporting & Visualization - Scorecarding & Dashboarding - Predictive Modeling - Business Rules & Optimization - Forecasting & Simulation - Real-time Decisions - Social Analytics - Sentiment Analysis	- Program scorecards and dashboards - Operational/ financial planning - Operational and financial reporting - Citizen sentiment analysis - Compliance and risk management

Citizen services and program performance analytics

Complete view of all programs, budgets, costs and citizen requirements.
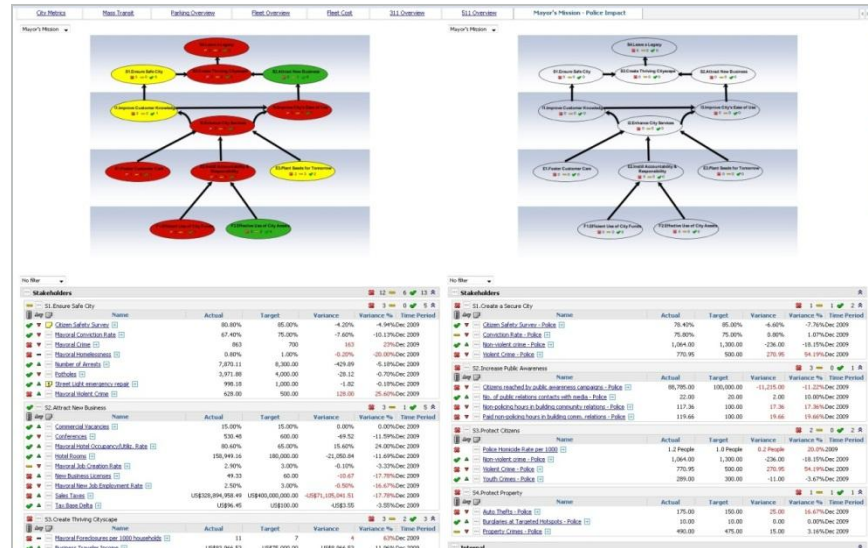
Strategic view to manage the delivery of citizen services requirements.
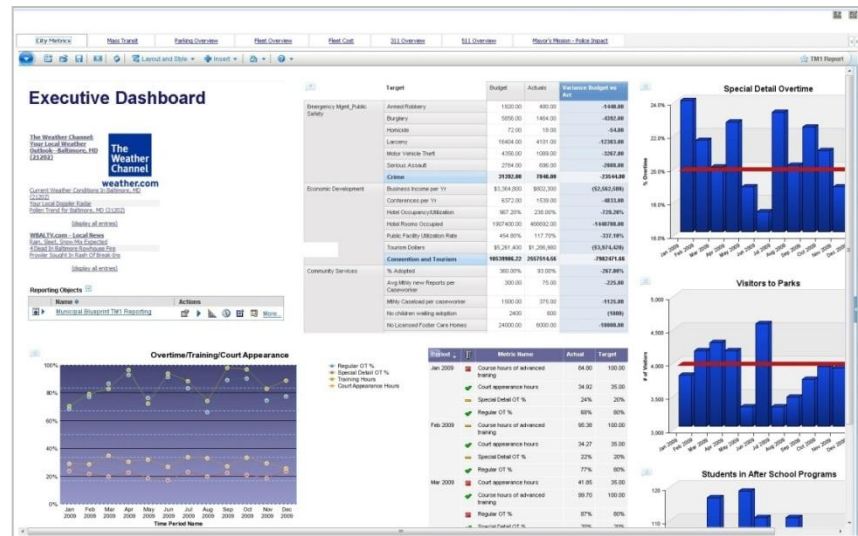
Citizen services and program performance analytics

Predict and target the needs of citizens more accurately.
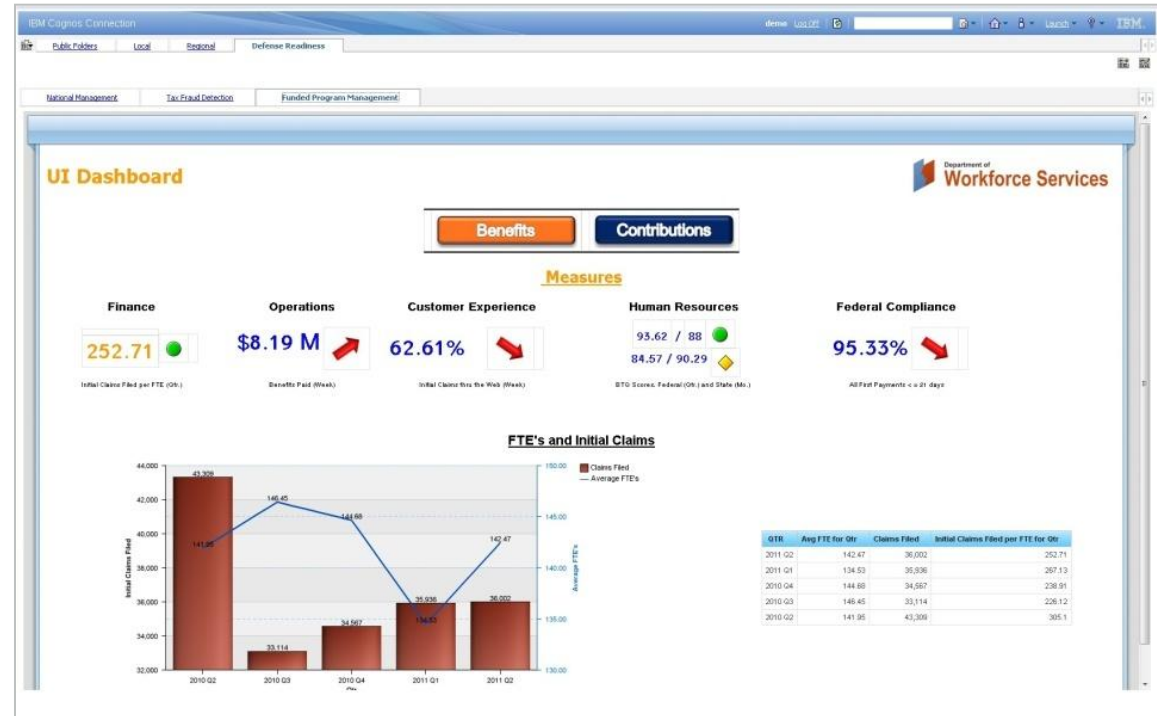
Alameda County Department of Social Services
Closing service gaps through better use of information

The Solution

- Alameda teamed with IBM to deploy an information management system that combines entity analytics with business intelligence to give workers an agency-wide, comprehensive view of individual cases.

- A near-real-time view of cases gives workers deeper insight, enabling service flexibility, avoiding regulatory sanctions and saving money by reducing fraud and waste—such as payment to individuals who are no longer eligible for assistance.

Alameda County
Social Services
Agency

"It's not just about making us more efficient, though it's certainly doing that. It's helping us reach out to those who need us, making sure they don't fall through the cracks. It's about using our resources wisely and effectively to improve people's lives, better than we ever could before. ."

— Don Edwards, assistant agency director, Alameda County Social Services

Key benefits

$11 million
Savings across the Agency by reducing waste through understanding which benefits should be paid out.

Deeper insight
For social workers who now better understand relationships between benefit recipients and programs, helping to eliminate waste, fraud and redundancy.

Clark County Department of Family Services
Using analytics to improve services, streamline processes and support funding claims

Solutions

- Clark County implemented a phased deployment of business analytics technologies to meet both immediate business needs and long-term goals.

- The initiative started with the creation of a project team that represented user across the whole organization, at every level from report-writers to senior executives.

- This team set the key objectives – implement the business analytics solution to deliver the required capabilities for metrics, dashboards, reporting, analysis and self-service information delivery.

clark county department of
family services

"… the real ROI is what it has meant for the Family Services Department. And that is that our staff can now devote more time going out into the community and provide services to families and children."

- Eboni Washington, Supervisor, Clark County Nevada

Key benefits

$10 million
Return on the investment seen in additional funds made available to the Department of Family Services

55 percent
Increase in the time new reports can be developed almost than before, and no longer require support from the IT team.

Analytics turn data to insights to actions for effective operations

Managing resources effectively and efficiently means:
- Budgets are prepared and executed against program goals.
- Taxes and other revenue is collected and fraud is reduced.
- Top performers are retained and salaries and benefits competitive.
- Outages in key public services are prevented.
- Operational costs are lowered.

Data	Analytics capabilities	Insight into action
▪ Tax information systems ▪ Budget and finance systems ▪ Program data systems ▪ HR systems	▪ Financial Reporting ▪ Financial Consolidation ▪ Planning, Budgeting & Forecasting ▪ Performance Management ▪ Disclosure Management ▪ Scorecarding & Dashboarding ▪ Predictive Analytics	▪ Financial scorecards and dashboards ▪ Operational/ financial planning ▪ Operational and financial reporting ▪ Compliance and risk management

Analytics for managing budgets, operations and revenue

Strategic view of revenue, budgets, costs and expenses government-wide or at the agency and departmental level.
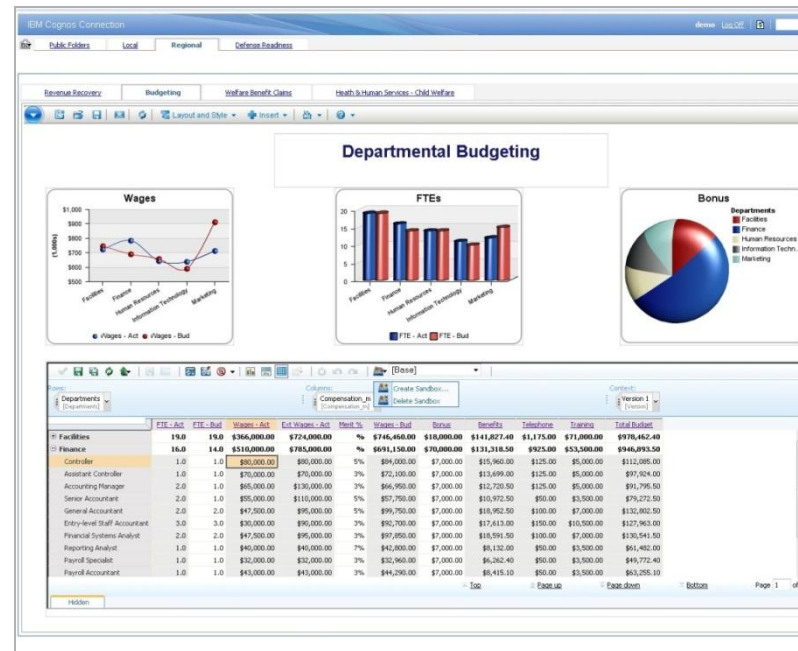
Better predict who will pay their taxes, help prevent social services waste fraud and abuse, and guard against improper payments.

Analytics for managing budgets, operations and revenue

Predict and help prevent outages in key public services and reduce operational costs.
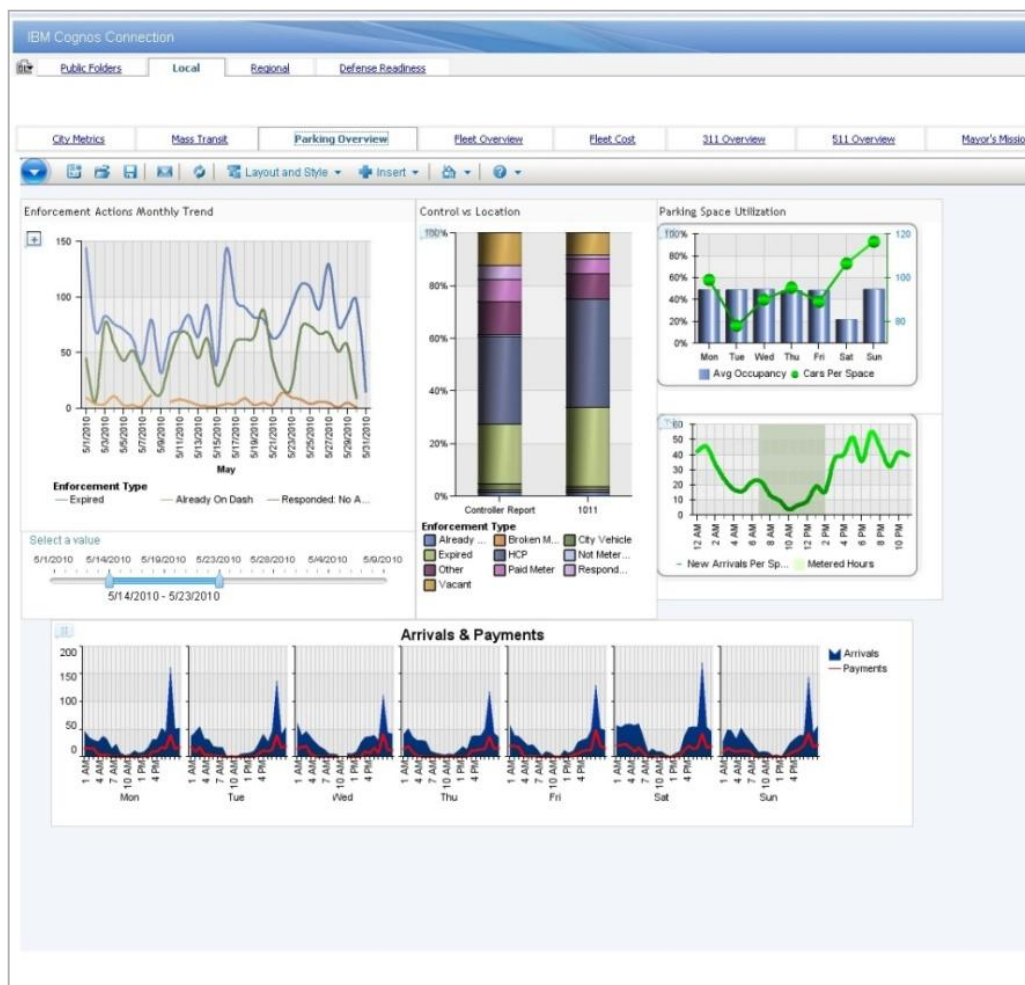
How we can address recent tax fraud issues tomorrow?

1) The Commissioner of Revenue is monitoring tax collection and receipts through a dashboard.

2) The Commissioner contacts his staff to for a deeper analysis of recent tax fraud, how rampant and how to address it.

3) The staff analyzes data on tax collections, identifying possible areas of non-payment.

Tax information systems

4) The staff analyzes data on tax collections and possible fraud, identifying possible areas of non-payment.

5) Non-payers are classified as low-risk for non-payment and high-risk for non-payment.

6) The agency determines the best collection strategy for low-risk and high-risk non-payers, focusing resources on high-risk..

7) The agency runs predictive analysis to determine possible methods of fraud based on historical data, identifying patterns that can be stopped.

8) The agency makes recommendations on collections of outstanding tax debt as well as recommendations on how to reduce tax fraud with analytics.

Outcome:
The Commissioner presents the new strategies for collections of outstanding tax debt and reduction of fraud to the governor.

Capture   **Predict**   **Act**

Detroit Public Schools

Gaining tighter control of budgets and supporting restructuring with business analytics

Solutions

- Blue Line, an IBM® Business Partner, worked with Detroit Public Schools to implement IBM Cognos® TM1® and IBM Cognos Business Intelligence.

- The solution provides a web-based solution for financial planning that provides real-time insight into school budgets.

DETROIT PUBLIC SCHOOLS

"We need to clear our deficit within the next five years, which means we need to make better decisions about resource allocation, exercise tighter control on spending, and protect the finances of our school system against the influence of external factors."

— Marc Ingram, Senior Systems Budget Analyst, Detroit Public Schools

Key benefits

$232 million
Reduction in the operating budget with better insights used to close low-performing schools

Single, accurate source
of financial data to support accurate decision-making throughout the District.

Chickasaw Nation Division of Commerce

Using analytics to streamline financial processes and better manage finances

Solutions

- The Chickasaw Nation Division of Commerce uses advanced predictive analysis and complex statistical modeling to steer its growing operations to success, making decisions based on fact instead of intuition.

- In addition to more accurate financial planning, including revenue forecasts and cash flow analysis, the business analytics solution allows managers throughout the organization to track their performance in near-real time and apply valuable insights to day-to-day decisions.

the Chickasaw Nation

"By spreading analytics to the operational side of the business, we would gain a better understanding of how the patrons of our hotels and casinos behave, what the costs are, and where the opportunities for increasing profits can be found."

— Patrick Neeley, Chief Financial Officer, Chickasaw Nation Division of Commerce

Key benefits	**100s** of hours saved	**50** percent
	By reducing manual reporting and eliminating the need to hire 20% more in staff for financial analysis	**Improvement** in the time new reports can be developed than before, and no longer require support from the IT team.

A state legislature in the United States

Improved response times for legislator requests and near-real time budget views

The Solution

- With the help of an IBM Business Partner, this state legislature in the United States, implemented IBM Cognos TM1 to collect, consolidate and report on its budget.

- The client can now develop a budget model, create summary cubes and conduct integration testing. In addition, it can build committee and highlights reports, deliver training and configure security, as well as deploy the budget model to analysts.

Solution Components

- IBM® Cognos TM1

Key benefits

Near-real-time visibility

Into the budget as it is assembled and reduced the amount of data entry needed to create the budget and budget reports .

Improved response times

For legislator requests and can now easily provide information using a variety of views of the same data

A State Office of Management and Budget

Improves efficiency, reduces risk, and achieves compliance of reporting processes

The Solution

- IBM Cognos Disclosure Management software provided a single application that could consolidate Microsoft Excel software, Microsoft Word software and financial reports into PDF format for seamless print publishing and web posting.

- Furthermore, licensing and maintenance agreements ensured that the OMB would receive full technical support from IBM, and would be able to take advantage of future upgrades.

Solution Components

- IBM® Cognos Disclosure Management

Key benefits

Automated collection
And validation of data from disparate information sources.

Report templates
Linked the underlying data, ensuring that any corrections are automatically reflected throughout the document

It is this holistic approach that turns information into insight and insight into outcomes through IBM Business Analytics

Transform

through analytics
for breakaway
results

Align

your organization
around information

Anticipate

see, predict and shape
outcomes

Act

with confidence at the point of
impact to optimize outcomes

Learn

from solutions that get
smarter with every outcome
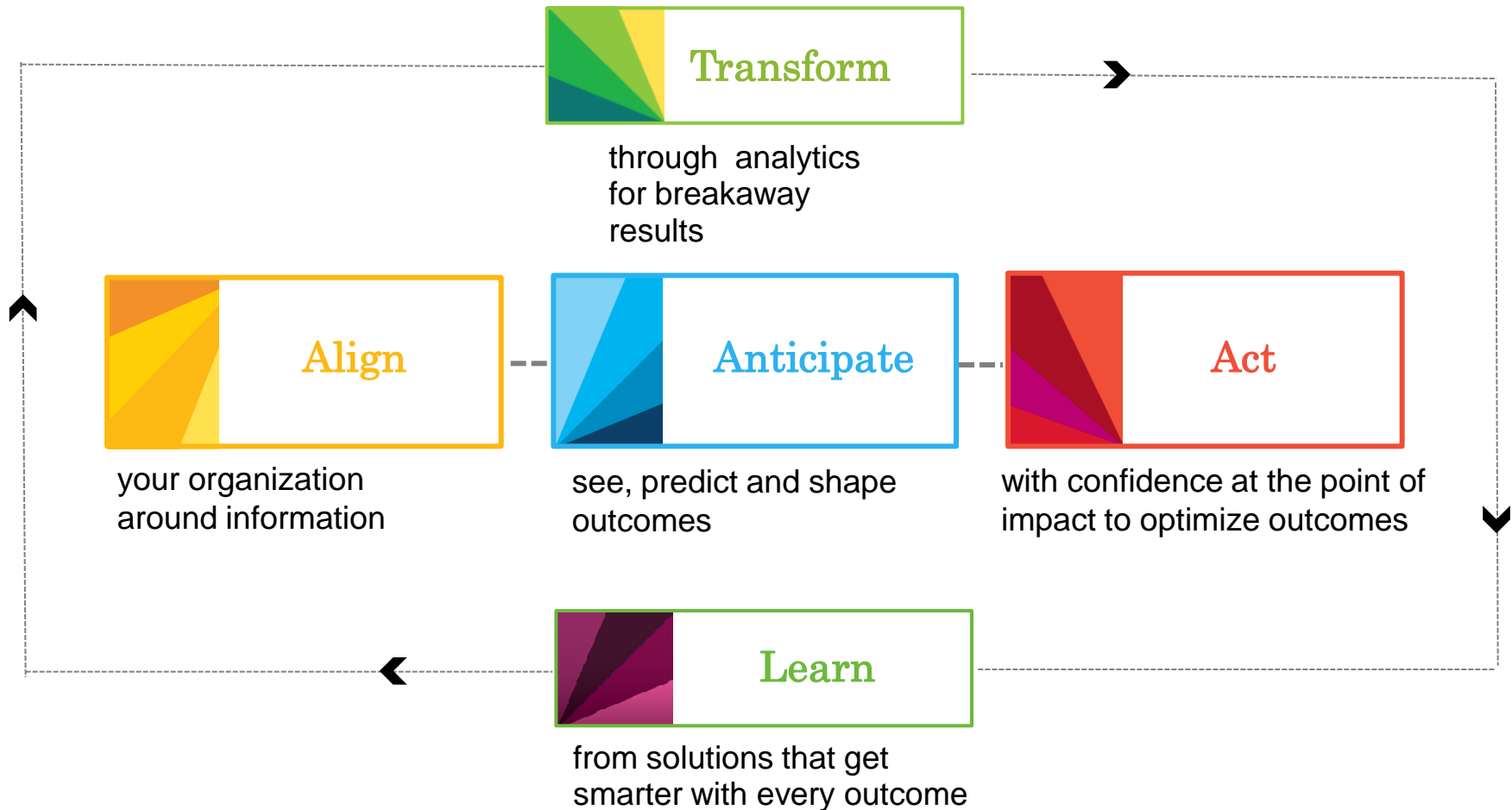
An Analytics Center of Excellence may be right for you

Analytics Center of Excellence

Strategy and Value

People and Process

Technology

It helps to align all parts of the organization around the analytics strategy

Strategy and Value

- Analytics Vision
- Enterprise Alignment Framework
- Analytics Roadmap to AQ maturity

People and Process

- Organizational Models
- Operational Framework
- Governance
- Implementation Methods
- Shared best practices
- Communication & Success Metrics
- Training programs and curriculum
- User Adoption and Self-service
- Community Services
- Project Services
- Coaching and Mentoring

Technology

- ACE Private Cloud/Shared Service Architecture
- Provisioning and On-boarding
- Data Integration, Architecture and MDM
- Operational Support

Organizations with a Center of Excellence gain increased visibility, agility, and speed

> **"Centers of Excellence" or "Competency Centers" are a proven way to overcome the challenges of delivering Business Analytics Excellence**

Alignment:
"The cooperation between IT and Business Users is much stronger in companies with an established BI Competency Center."

User Adoption:
"Every department has a higher usage of BI software when a BICC is part of the organization."

Business Value:
Overall, companies with BICCs outperformed those without competency centers in all ten of our measures of user satisfaction with BI initiatives.

Organization of BI, BARC Institute, Wurzburg, 2008, 2010

AQ = **Analytics Quotient**

$$= \frac{\textbf{Realized}}{\textbf{Potential}}$$

The more you infuse analytics into your organization, the higher your AQ and the better you and your organization will perform

What is the Analytics Quotient?

Landing Page Example

What it determines:

- It is a way to know how well you're using analytics - and where to go next.

What it helps determine:

- It measures how ready you are to apply insight to your strategy, processes and tactics;

- How quickly you can re-allocate resources and re-orient your people to make better decisions;

- How effectively you can act based on how well you know your past performance, current results and future possibilities.

It's simple: The more you embrace analytics, the higher your AQ. The higher your AQ, the better the outcomes - for you, your team and your entire organization.

High AQ organizations dramatically outpace low AQ organizations

ALIGNED
Collaboration across
organization objectives

AWARE
Alert, observant, informed
and perceptive

High AQ

AGILE
Highly responsive to
changing priorities

FOCUSED
Clear understanding of
what's important

PREDICTIVE
Able to anticipate, look forward
and set expectations
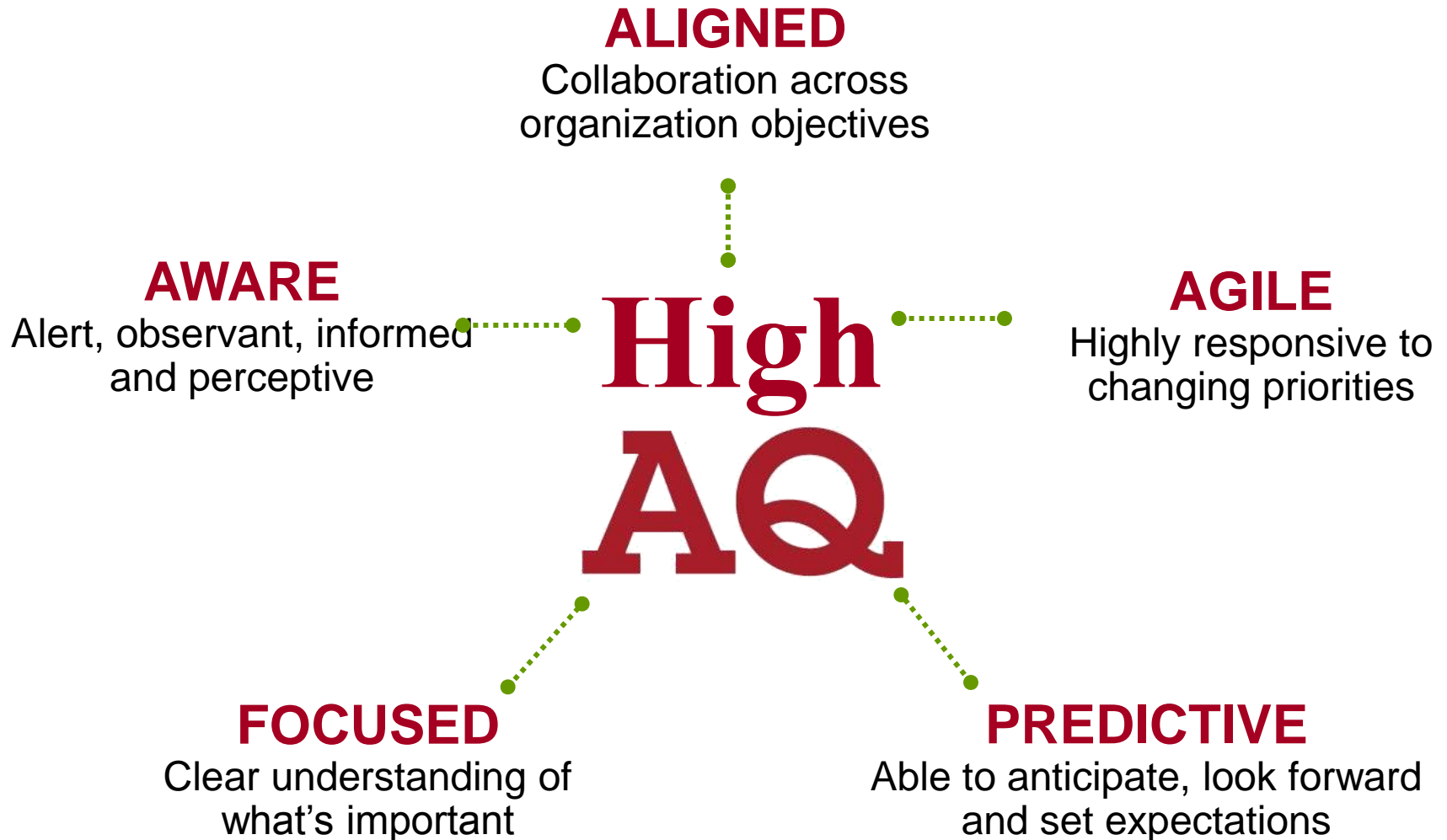
AQ maturity is determined by:

- Decision-making savvy
- Readiness and capacity to leverage analytics across critical roles and processes
- Mastery of information

Manual, slow, error prone, cumbersome, fragmented Data quality concerns

Automated, instant, accurate, seamless, converged Data governance is in place
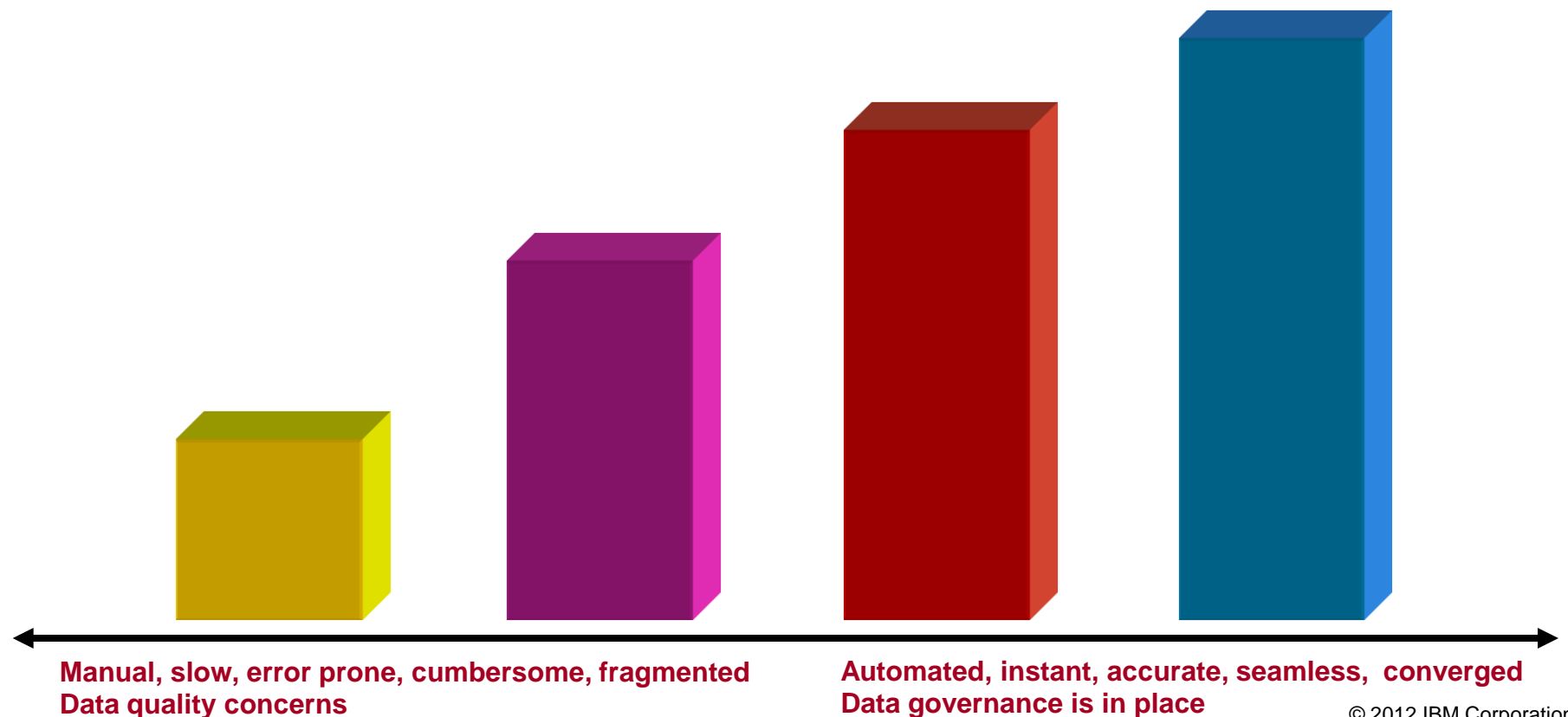
Outlined in a path to analytics success we call
"The AQ Journey"

STEP 4:
Master

- Top-down goal setting

- Insights flow freely across divisions and departments.

- You allocate resources, minimize risk and maximize outcomes with equal ease and speed

STEP 3:
Leader

- Your leadership sets the strategy

- Your department's metrics map to other departments metrics

- You look forward as much as you review the past

STEP 2:
Builder

- You have a view into current results and a little of what's driving them

- Results are shared with other teams within your department

STEP 1:
Novice

- You rely on spreadsheets with information gaps

- The rear view is your only view

Manual, slow, error prone, cumbersome, fragmented Data quality concerns

Automated, instant, accurate, seamless, converged Data governance is in place

How can you determine your organization's AQ?
The IBM Business Analytics AQ Workshop

How does it work?

- It starts with our AQ quiz to learn your score. It's quick, it's easy, and it will put you on the path to better business outcomes, whether you're an aspiring newcomer or a wizened analytics master.

When you've finished, we'll give you:

- Your AQ Score

- Your stage in our AQ Maturity Model

- Specific guidance, tools and resources that will speed up your journey.

We follow up with an AQ Workshop to:

- Review your organization's answers

- Make recommendations and share best practices.

- Design a roadmap to help you raise your AQ

The IBM Business Analytics AQ Workshop

- A three- or six-hour review of your organization's AQ score, as determined by **your organization.**

- We start by surveying your organization on their view on the use of analytics throughout the organization.

- We develop a presentation that reviews the aggregated results of each of the AQ Survey questions and present a recommendations and timelines for deployment.

- We show the art of the possible with client success stories and demonstrations of solutions.

- We deliver a written report that serves as a roadmap to build and raise your AQ.

What's Your AQ?

It is this approach to link data with analytics capabilities to manage outcomes

How are we doing?	Why is this occurring?	What should we be doing?

The Analytics Layer

Analytics capabilities

Dashboards & scorecards	Social Analytics	Reporting & visualization	Sentiment Analysis	Real-time Decisions	Forecasting & simulation	Predictive modeling	Planning/ budgeting

The Data Layer

Varied, unconnected data sources

Message sources	Relational sources	Unstructured data	Application sources	OLAP sources	Modern and legacy sources

Through the rich portfolio of IBM Business Analytics aligned to the needs of government decision-makers and leaders

Business analytics capabilities	Business outcomes/benefits
Business intelligence	▪ Get a strategic view to manage the delivery of citizen services and program requirements. ▪ Position resources to focus on high-priority service areas.
Predictive analytics	▪ Predict and target the needs of citizens and match programs and resources to meet highest-priority citizen needs. ▪ Predict and help prevent outages in key public services.
Analytical decision management	▪ Match programs and resources to meet highest-priority citizen needs. ▪ Position resources to focus on high-priority service areas. ▪ Improved financial and operational governance, reduced risk, and compliance
Performance management	▪ Strategic view of revenue streams, budgets, costs and expenses at all levels of the government enterprise. ▪ Leverage collaborative budget preparation and execution.
Risk management	▪ More effectively measure and monitor financial and operational risk across agencies. ▪ Use reporting capabilities to support compliance with internal and external requirements.

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